

REMARKS

Claims 5 and 7-21 are pending in the application.

By the foregoing Amendment, claims 5, 7, 8, 9, 10, and 11 are amended. Claims 1-3 are cancelled without prejudice or disclaimer. New claims 14-21 are added, which are apparatus claims; and of which claims 14-16 are based on canceled method claims 1-3. New claims 14-21 are included in elected Group II.

Claims 8 and 9 are amended to correct their dependencies to provide antecedent basis for “the guide rod” recited therein.

Claims 10 and 11 are amended to change “supply device” to “supply means” in accordance with 35 U.S.C. § 112, paragraph 6. Similarly, claim 11 and claims 7 and 8 depending therefrom are amended to change “linear guidance mechanism” to “linear guidance means.”

These changes are believed not to introduce new matter, and entry of the Amendment is respectfully requested.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding rejections, and withdraw them.

Rejection under 35 U.S.C. § 112, ¶ 2

On page 2 of the Office Action, claims 5 and 7-13 were rejected under section 112, paragraph 2 on three separate grounds, which will be addressed separately.

1. *Claims 10 and 11 seek “to improperly link a positively recited element ... to an unclaimed or merely indirectly recited element...”*

This rejection is respectfully traversed on the basis that it is contrary to established PTO procedure and case law.

No authority is cited for the basis of this rejection. Applicant’s counsel is not aware of any directive in the MPEP, or any case law, to the effect that a claim is rendered indefinite by linking of a positively recited element to an unclaimed or indirectly recited element. On the contrary, both the MPEP and the case law cited therein specifically have sanctioned such a claim limitation. *See, for example*, MPEP 2173.02 and *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986) cited therein¹; and MPEP 2111.02 and *In re Stencel*, 828 F.2d 751, 4 USPQ2d 1071 (Fed. Cir. 1987) cited therein.² In both *Orthokinetics* and *Stencel*, the

¹ The claim at issue in *Orthokinetics* read in pertinent part:

In a wheel chair having a seat portion, a front leg portion, and a rear wheel assembly, the improvement wherein *said front leg portion is so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof* whereby said front leg is placed in support relation to the automobile and will support the seat portion from the automobile in the course of subsequent movement of the wheel chair into the automobile

806 F.2d at 1568 (emphasis added). The court acknowledged that “one desiring to build and use a travel chair must measure the space between the selected automobile’s doorframe and its seat and then dimension the front legs of the travel chair so they will fit in that particular space in that particular automobile,” but found that “the claims were intended to cover the use of the invention with various types of automobiles” and that the phrase was “as accurate as the subject matter permits, automobiles being of various sizes.” *Id.* at 1576. The court emphasized that “patent law does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims.” *Id.* at 1576.

² The broadest claim in *Stencel*, claim 1, read as follows:

A driver for setting a joint of a threaded collar, a threaded pin, and at least one sheet, the collar having plastically deformable lobes on its longitudinal exterior that upon the existence of a predetermined clamp-up load between the collar and the sheets plastically deform in radial compression and displace material of the collar into void

claims linked a positively recited element (in *Orthokinetics*, “said front leg portion”; and in *Stencel*, “the minimum distance between each flat and the rotational axis” and “means on the body to receive a wrenching torque applied to the driver”) to an unclaimed element (in *Orthokinetics*, “the space between the doorframe of an automobile and one of the seats thereof”; and in *Stencel*, “the radius of the collar at the location of the lobes” and “the lobes of the collar,” respectively. Further, in *Orthokinetics*, the court specifically addressed the propriety of the claim language under section 112, second paragraph. Although in *Stencel*, the issue was whether the preamble constituted a limitation for purposes of patentability, the court also stated in dictum: “As a matter of claim draftsmanship, appellant is not barred from describing the driver in terms of the structure imposed upon it by the collar having plastically deformable lobes.”

2. In claims 10 and 11, it is not clear “where the ‘rear area’ is relative to the other recited elements of the wall cutter apparatus”

This rejection is believed to be overcome by the above amendments to claims 10 and 11 to add the limitation “the rear area being formed above the frame in the cut trench.”

volumes between the collar and the pin to lock the two together and terminate the action of the driver on the collar, the driver comprising:

- (a) a body having a rotational axis;
- (b) a socket in the body having a plurality of flats that when cut by radial planes normal to the rotational axis fall on the sides of a regular polygon, the flats being parallel to the rotational axis;
- (c) the minimum distance between each flat and the rotational axis corresponding substantially to the radius of the collar at the location of the lobes after their plastic deformation; and
- (d) means on the body to receive a wrenching torque applied to the driver so that the flats apply the torque to the lobes of the collar.

3. *“The at least one cutting wheel” in claim 5 lacks antecedent basis*

This rejection is believed to be overcome by the above amendments to claim 5 to change “cutting wheel” to “cutting means” as suggested by the Examiner.

Rejections under 35 U.S.C. § 102

1. *Rejection based on Japanese Patent Abstract No. 11200404*

On page 3 of the Office Action, claims 5 and 10 were rejected under section 102(b) as being anticipated by Japanese Patent Abstract No. 11200404. To the extent the Examiner may consider this rejection to be applicable to claims 5 and 10 as amended, it is respectfully traversed as being based upon a reference that does not teach all the elements of the claimed invention.

A machine translation of Japanese Patent Abstract No. 11200404, obtained from the Japanese Patent Office, is submitted herewith for the Examiner’s reference.

Japanese Patent Abstract No. 11200404 discloses a soil improvement and solidified wall construction device, wherein a housing is hung down to a place separate by the prescribed length from the existing structure. Next, excavation is propelled vertically downward by rotating cutter drums by a hydraulic motor. Next, when the cutter drums reach the expected depth of a foundation improvement, the cutter drums are rotated while raising the support frame; and, at the same time, a cement liquid is forcibly sent up to a high pressure injection nozzle from a supply device to be injected from the cutter drums. The injected cement liquid also excavates the surrounding ground, and cutting earth-sand and the cement liquid are mixed together to form an improved body.

In the present invention as recited in amended claim 10, supply means are located on the frame for supplying a settable liquid into the cut trench at the frame. Contrary to the requirements

of claim 10, Japanese Patent Abstract No. 11200404 discloses nozzles located on the cutter drums for supplying a cement liquid into the cut trench at the cutting drums, which are *below* the housing.

In view of the foregoing, it is respectfully submitted that the invention as recited in claim 10, and claim 5 depending therefrom, is not anticipated by Japanese Patent Abstract No. 11200404, and that the rejection should be withdrawn.

2. Rejection based on German patent document 1,634,262

On page 4 of the Office Action, claims 5 and 10 were rejected under section 102(b) as being anticipated by German patent document 1,634,262. To the extent the Examiner may consider this rejection to be applicable to claims 5 and 10 as amended, it is respectfully traversed as being based upon a reference that does not teach all the elements of the claimed invention.

German patent document 1,634,262 describes a trench wall cutter that is suspended on cables. The cutting wheels are rotated by hydraulic drives in opposite directions. A suction pipe 1 is provided for suctioning off fluid and stripped soil material directly at the cutting wheels. Within the suction pipe 1 tube there are provided two hydraulic lines 2, 3 for supplying hydraulic fluid to the hydraulic drives of the cutting wheels and one hydraulic line 3a for the backflow of the hydraulic fluid.

The structure of German patent document 1,634,262 reference is completely different from that of the present invention. First, the hydraulic lines 2, 3 supply hydraulic fluid to the hydraulic drives of the cutting wheels 6, 7; they do not introduce a settable liquid into the cut trench at the frame of the trench wall cutter, as required by claim 10. Further, a person skilled in the art would not introduce the liquid at the frame of the trench wall cutter according to the cited reference, since

the suction pipe 1 with the suction opening 16 would lead to an undesired direct back flow or the introduced fluid by the suction pipe 1.

Still further, as can be seen from the single figure of the reference, both cutting wheels 6 and 7 convey the stripped soil material to a center area above the suction tube. By means of a suction opening 16, the stripped soil material is conveyed outside the cut trench. Thus, the reference also does not teach "at least one cutting means located on the frame for conveying soil material stripped through the free space past the frame into a rear area of the cut trench and for intermixing the soil material and the liquid together in the cut trench, the rear area being formed above the frame in the cut trench," as required by claim 10.

In view of the foregoing, it is respectfully submitted that the invention as recited in claim 10, and claim 5 depending therefrom, is not anticipated by German patent document 1,634,262, and that the rejection should be withdrawn.

Rejections under 35 U.S.C. § 103

On page 5 of the Office Action, claims 7-9 and 11-13 were rejected under section 103(a) as being unpatentable over German patent document 1,634,262 in view of Ressi di Cervia. To the extent the Examiner may consider this rejection to be applicable to claim 11 as amended, and claims 7-9, 12, and 13 depending therefrom, it is respectfully traversed for the reasons stated above with respect to the rejection of claim 10, as well as for the reasons stated below.

Ressi di Cervia describes a system for constructing narrow underground walls utilizing the slurry trench method, wherein a first apparatus (dredge 10 or 10') excavates from one end of a slurry filled trench and a second apparatus (submersible boom 21 or floating belt conveyor 21', which are

both separate from and separated from the first apparatus) is utilized for filling the other end of the trench with a wall forming material.

In the Office Action, it was conceded that German patent document 1,634,262 does not teach either (1) the trench wall cutter being located in substantially vertically displaceable manner on a carrier implement or (2) “a linear guidance mechanism for displaceably guiding the trench wall cutter on the carrier implement.” Ressi di Cervia was cited as teaching these two features.

Like claim 10, claim 11 recites “means for introducing a settable liquid into the cut trench at the frame of the trench wall cutter.” If the frame recited in claim 11 is taken to correspond to the first apparatus of Ressi di Cervia (dredge 10 or 10'), then Ressi di Cervia, like German patent document 1,634,262, does not teach means for introducing a settable liquid into the cut trench at the frame of the trench wall cutter, because Ressi di Cervia introduces the settable liquid into the cut trench at the second apparatus (submersible boom 21 or floating belt conveyor 21'). Thus, German patent document 1,634,262 and Ressi di Cervia in combination do not teach or suggest the invention as recited in claim 11.

Also like claim 10, claim 11 recites “at least one cutting means located on the frame for conveying soil material stripped through the free space past the frame into a rear area of the cut trench and for intermixing the soil material and the liquid together in the cut trench, the rear area being formed above the frame in the cut trench.” If the frame recited in claim 11 is taken to correspond to the second apparatus of Ressi di Cervia, (submersible boom 21 or floating belt conveyor 21') then Ressi di Cervia does not teach “at least one cutting means located on the frame for conveying soil material stripped through the free space past the frame into a rear area of the cut trench and for intermixing the soil material and the liquid together in the cut trench, the rear area

being formed above the frame in the cut trench,” because Ressi di Cervia’s cutting head is provided as part of the first apparatus (dredge 10 or 10’). Thus, again, German patent document 1,634,262 and Ressi di Cervia in combination do not teach or suggest the invention as recited in claim 11.

Also Ressi di Cervia does not give any indication to provide a trench wall cutter with a circumferential free space around the frame by means of a rigid guide rod so as to allow a reliable guidance, and therefore in spite of the all around free space surrounding the frame a precise making of a cut trench is possible.

According to the invention, the frame of the cutter is guided without lateral contact with regard to the surrounding trench wall, resulting in a continuous free space around the entire frame. By this means, the upward removal of the stripped soil material and of the introduced liquid is facilitated. As enhanced flow in the upward direction also leads to a better intermixing in the rear area of the cut trench.

It is in this aspect particularly advantageous, that by the surrounding continuous free space suspension could be redrawn from the top, so that a circulation flow in the cut trench can be built up. By this way, a deposition effect can be effectively prevented, during which coarse grained material settles downwards while the liquid moves upwards. The significant better intermixing effect also allows to add the viscous setting liquid during the lowering of the cutter.

Altogether, by the all around free space of the frame an excellent intermixing effect is achieved and simultaneously a high guidance stability can be ensured.

New claims 14-21

New independent claim 14 relates to apparatus for making a trench wall in the ground, in which at least one cutting wheel located on a trench wall cutter is given a rotary movement by a drive, the trench wall cutter is lowered into the ground and soil material below the cutting wheel is stripped and a cut trench made, which is filled with a sealable liquid. The stripped soil material is conveyed from the cutting wheel into a rear area of the cut trench, the stripped soil material in the cut trench is intermixed with the settable liquid and the stripped soil material is at least partly left in the cut trench for forming the trench wall.

Japanese Patent Abstract No. 11200404 discloses a hung up system for suspending the excavator main body, wherein a housing contacts the walls of the borehole in order to ensure the guidance of the excavation device, while the present invention as claimed in new claim 17 depending from new claim 14 recites linear guidance means for displaceably guiding the trench wall cutter. This feature is also recited in claim 11.

New dependent claim 18 (and also claim 7 depending from claim 11) further provides that the linear guidance means has a guide rod, on which the trench wall cutter is mounted. Such a guide rod system makes it possible to keep the trench wall cutter frame cross section as small as possible. In particular, it is no longer necessary for the trench wall cutter frame to be in contact with the cut trench wall for lateral guidance purposes. The frame can therefore be designed without guide members and its dimensions can be kept correspondingly small, which omits a simple passage of stripped soil material and an effective mixing with the introduced settable liquid.

Additionally, a guide rod permits a particularly good lateral guidance of the trench wall cutter. As recited in new dependent claim 21, it particularly allows a transfer of an axial force

directed in the advanced direction of the trench wall cutter, which makes it possible to obtain a particularly rapid advance of the cutter during sinking.

By the features of the present invention as recited in new claims 14-21 are effected that during the making of the cut trench and/or on extracting the trench wall cutter from the finished cut trench, a free space is formed around all lateral sides of the frame. Through this the circumferential free space stripped soil material and suspension can flow in an unhindered manner past the trench wall cutter frame. This brings about a particularly rapid and power saving cutting with simultaneously a highly efficient mixing effect. The stripped soil material being conveyed into the rear area is allowed to sink down or to be sucked down in the direction of the cutting wheels in order to be reconveyed upwards by the rotating cutting wheels. By this effect a circulation can be established. As a result, the mixing effect is highly improved.

The guidance of the trench wall cutting device by means of a guide rod permits a reliable guidance of the trench wall cutter. It ensures a defined free space on all sides around the cutter. This is vital for a good fluid circulation and mixing effect.

Furthermore, the stripped soil material is conveyed from the cutting wheels into a rear area of the cut trench and is intermixed in the cut trench with the settable liquid which is simultaneously introduced into the trench. Therefore, the intermixing in the cut trench is a result of the action of the cutting wheels with the settable liquid and this takes place in situ, and in this way a hardening liquid soil mixture is produced.

In summary, the invention as recited in new claims 14-21 allows a very efficient cutting of the trench and mixing of the stripped soil material with a settable liquid having a high viscosity in one step. A good mixing is essential for the quality of the trench wall.

Conclusion

All objections and rejections have been complied with, properly traversed, or rendered moot. Thus, it now appears that the application is in condition for allowance. Should any questions arise, the Examiner is invited to call the undersigned representative so that this case may receive an early Notice of Allowance.

Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,

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